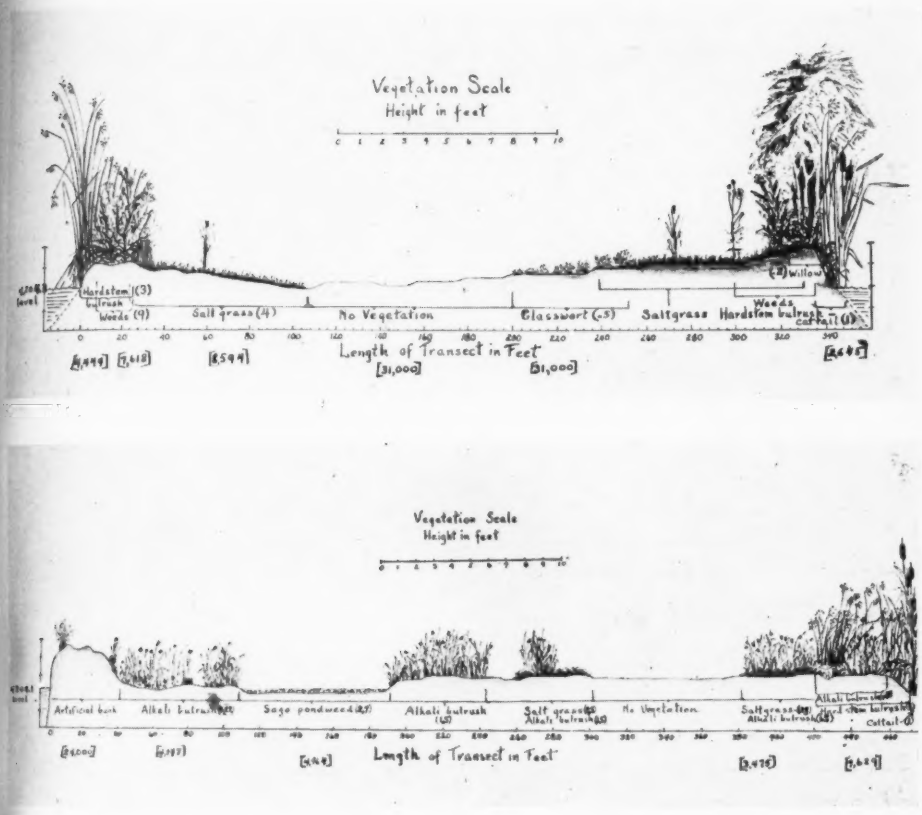
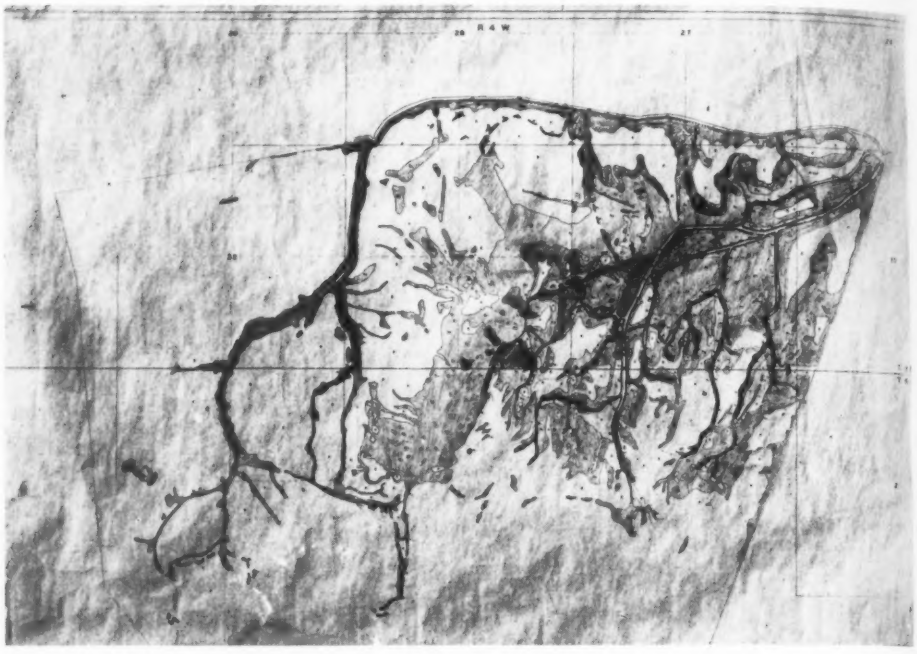
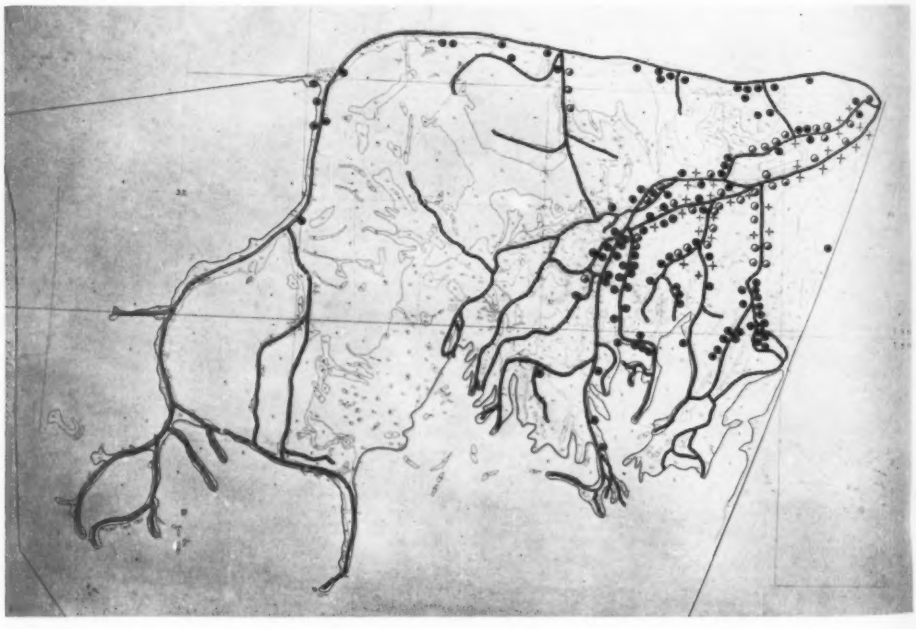


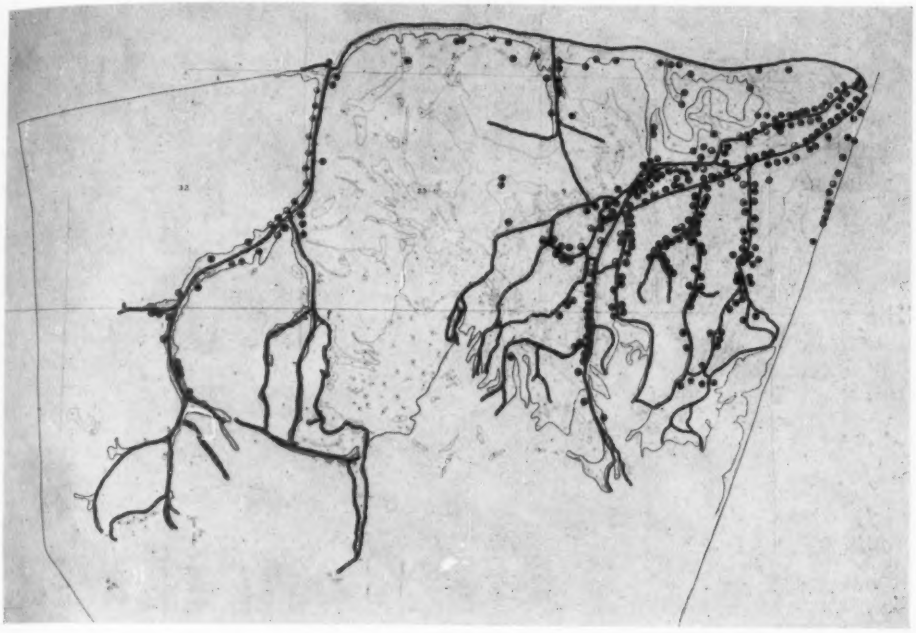
Schematic presentation of the zones of vegetation in the higher levels (upper) and in the lower levels (lower). Plant densities per linear foot are shown in parentheses and the amounts of soluble salts in the surface soil in brackets; the actual heights of vegetation may be measured by the horizontal scale.

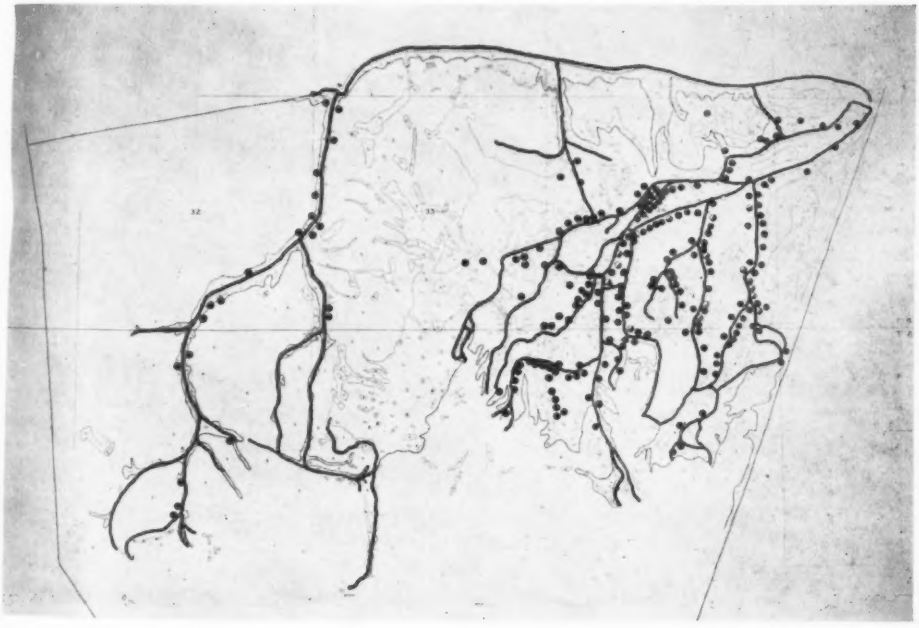




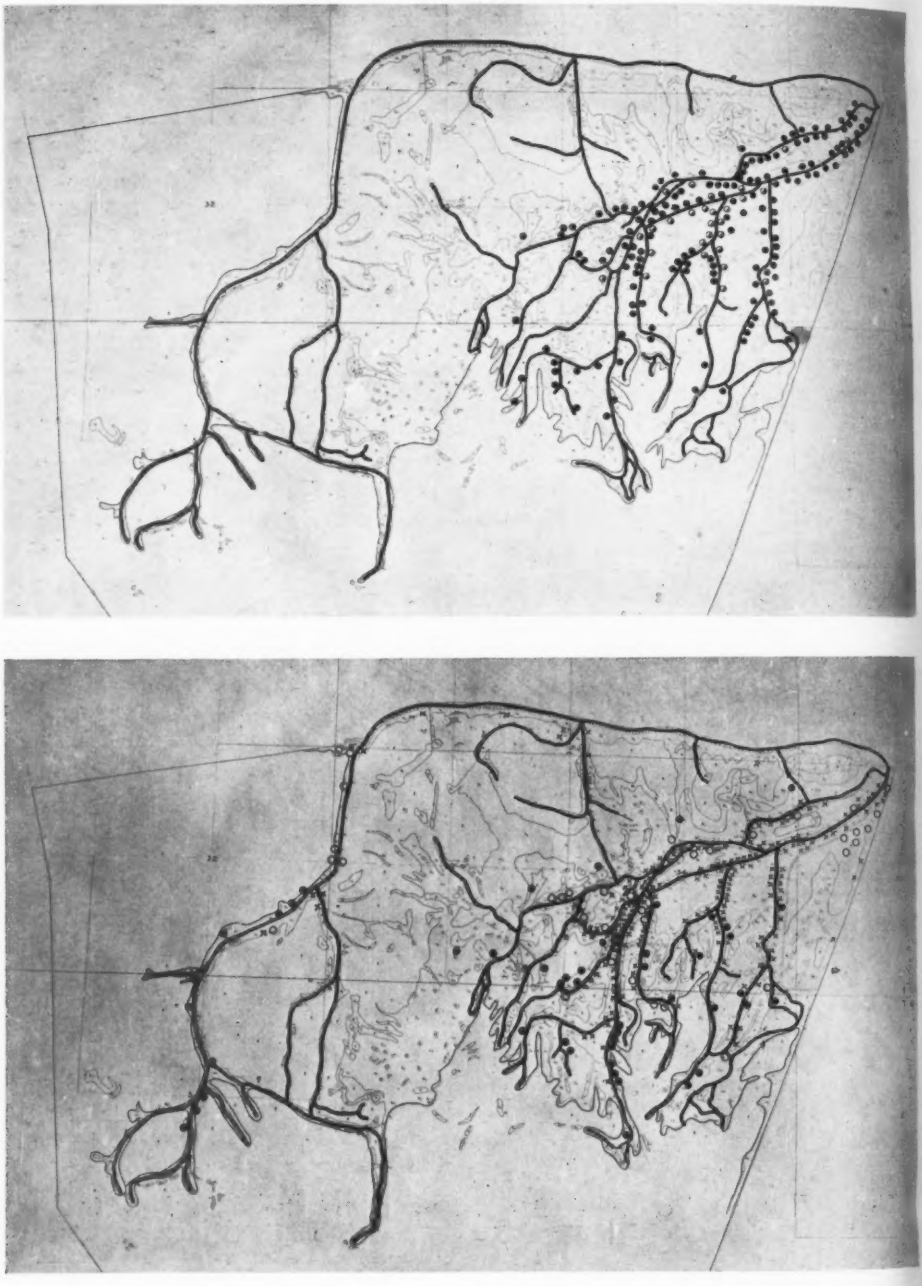
A. (*Upper*)—Cover type map of Unit II Bear River Refuge. Clear areas, if enclosed, represent barren flats; if not enclosed, open water. Lighter shading shows areas of alkali bulrush and the darker, hardstem bulrush and cat-tails.

B. (*Lower*)—Location of Gadwall nests.





A. (*Upper*)—Location of Cinnamon teal nests.
B. (*Lower*)—Location of Redhead nests.



A. (*Upper*)—Location of Mallard nests.
B. (*Lower*)—Location of Pintail, Ruddy, and Shoveller nests.

MOSQUITO CONTROL OPERATIONS ON TIDE MARSHES IN MASSACHUSETTS AND THEIR EFFECT ON SHORE BIRDS AND WATERFOWL

Harold M. Bradbury

Since 1931 the sportsmen and bird lovers, from time to time, have complained of the alarming decrease in the numbers of migratory fowl that visit Massachusetts marshes during their migrations. These conditions were officially called to the attention of the Department of Conservation early in 1936, and the Division of Fisheries and Game was authorized to proceed with a fact-finding investigation to be followed by such work as was necessary to bring about rehabilitation.

The Duxbury Marsh, comprising about 1,300 acres, was chosen as the experimental area because of the known falling off in the number of birds there, and its accessibility, situated as it is, less than forty miles from Boston. Prior to 1931, when mosquito control operations were completed, many different species of migratory fowl had been observed, and on several occasions flocks of American egrets tarried for at least a week. An idea of the former value of Duxbury Marsh is given by the remains of seven large gunning stands besides two that are still maintained, as well as by a number of small shooting boxes still intact but seldom used.

May and June of 1936 were used in making a thorough survey of existing conditions and in planning measures that should be taken to remedy them. We found the shallow water mud flats completely drained, with the bottom dried and cracked from exposure to the sun and air, and a salt-flat plant—glasswort—establishing itself. No birds were observed except one or two following a flood tide or a heavy rain, and they stayed only as long as it took the water to drain off. The pot holes had been ditched and drained so that they contained water only when the tide level was above their bottoms, and most of them were filling in with a coarse grass (*Spartina glabra*). Only an occasional bittern (*Botaurus lentiginosus*) and the two blue herons (*Ardea h. herodias and Florida c. caerulea*) were observed feeding on killifish stranded by the receding tide.

The disappearance of the eelgrass in Duxbury Bay was also taken into consideration as a factor in waterfowl shortage, but was one over which we had no control.

The Duxbury Marsh averages 10 feet in elevation, about the same as for all our tide marshes north of Cape Cod. The range in high tides is from 7.1 to a flood tide of 12.1, a variation of 5 feet in high tide range, and our ebb tides run from -2.2 to $+1.8$, giving a maximum range of tide level of 14.3 feet. From this it can be readily seen that flood or tide gates would be impractical, and plans for any such control were, therefore, not considered.

The Massachusetts State Reclamation Board had done an excellent job in eliminating the mosquitoes, and it was

realized that any restoration project must retain the good which had been accomplished. Furthermore, all plans were submitted to the Board for approval. Tentative agreement was reached early in July, subject to a check for mosquito larvae following the August flood tides. On the 16th of July the program was started with labor furnished by the National Youth Administration, and by the first of August the work was in full swing.

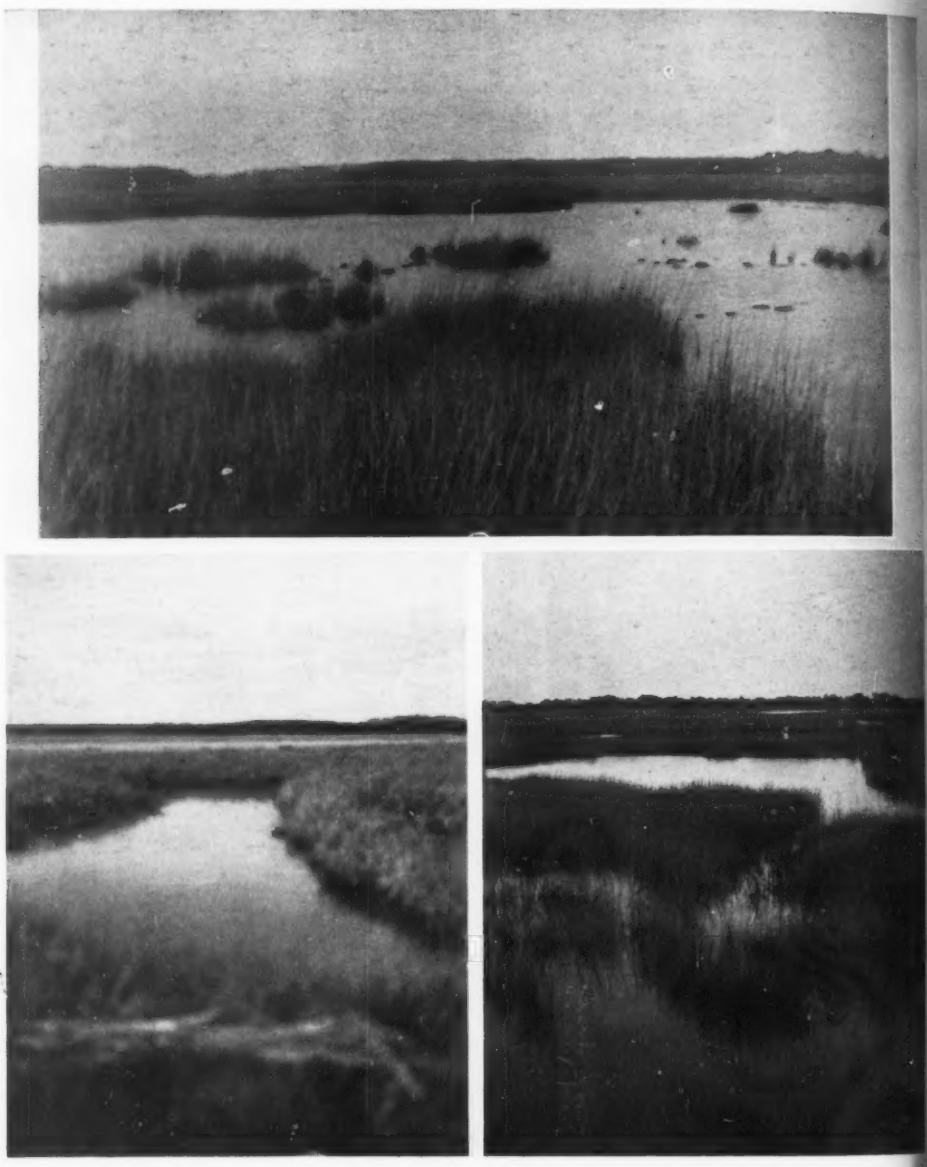
Development plans were based on the assumption that all mosquito larvae would be eaten by the killifish (*Fundulus heteroclitus macrolepidus*), and that our task was to recreate a desirable environment for the fishes where they would remain healthy and hungry during the lowest tides and the hottest weather, the period most favorable for mosquito reproduction.

This was done by damming the outlets with the peaty sod which had been removed in the drainage operations. The grass roots in these sod blocks were dormant but alive after five years of exposure, and grew again when subjected to the flow of the tide; within a year the root systems and tops extended to the point where they have again become an integral part of the marsh. Care was taken to hold the water level about nine inches below the surrounding marsh, thereby keeping the turf free from surface pools without changing the water table to an appreciable extent. By this treatment we were able to hold the marsh vegetation unchanged.

In the case of pot holes, the grass which was establishing itself, and in some cases completely filling them, was removed, thereby restoring them to a natural condition, before dams were placed. In some cases these holes were deepened to from 12 to 24 inches, and a portion of the bank shelved off to give the waterfowl a place to sun and preen. At points where no holes formerly existed, but where they were deemed desirable, new ones were excavated, and the water similarly controlled.

The shallow water shorebird stations were given slightly different treatment. In these, to deepen the water would have made them uninhabitable for the smaller waders, so we dug scattered holes from eight to ten feet in diameter and averaging eighteen inches in depth. These were made in the deeper portions from which the killifish could work out into the shallows and feed on the mosquito larvae or wrigglers. As the waters gradually receded during the low tide periods and from evaportion during warm weather, the killifish feeding area would gradually contract, but suitable environment was always present in the holes which had been dug until the next flood tides gave a fresh supply of water and restored the maximum feeding range.

When salt hay or black grass was harvested in former years, many shorebirds, particularly the black-bellied plover or beetle-head and yellow-legs, as well as other species frequented these cut-over areas in large flocks, feeding industriously midst the stubble. In order to restore somewhat similar conditions, we burned over several acres in small patches and found that in this way attractive areas could be created. Sand fleas, crickets, grasshoppers, periwinkles, grubs, and many other small



A. (*Upper*)—Restored shore bird station nearly an acre in extent. Where sod show water holes have been dug to keep the killifish alive during low water periods.

B. (*Lower left*)—Restored salt pond with preening ground on left shore.

C. (*Lower right*)—Restored pond used by both waterfowl and waders.

forms of animal life became readily available upon burning of the grass cover. It was common to see from 30 to 150 greater yellow-legs feeding in these patches during the fall migration.

This burning over was also of value in controlling the mosquitoes because of the quicker evaporation of the surface water through the removal of the shading grasses. August burning in small interspersed patches, thereby leaving cover strips for the marsh fauna, appears to give the best results.

The report of the Massachusetts State Reclamation Board which is of interest follows:

REPORT

November 16, 1937

To: Reclamation Board

FROM: R. W. Wales, Entomologist

SUBJECT: Division of Fish and Game Experiments on the Duxbury Marsh

An inspection of the experiments on the Duxbury marsh being carried on by the Division of Fish and Game, Department of Conservation, under the supervision of Mr. Bradbury, for the purpose of determining what changes can be made on salt marshes ditched to prevent mosquito breeding to create conditions favorable for wild birds was made on November 13th.

A number of salt ponds, which for the purposes of mosquito control had been opened by ditches so that the water would run out with the fall of the tide have been dammed at the outlet in a manner to permit the water to fall only about 9 inches as the tide recedes. This serves the purpose of removing water from the marsh immediately surrounding the pond so that conditions favorable to mosquito breeding are not produced and at the same time retaining sufficient water in the pond to provide suitable conditions for waterfowl. Some of these ponds dammed about a year ago provide a good opportunity to observe the probable effects on the control of mosquito breeding. Observations indicate no unfavorable effects and it would seem to be a safe method to pursue. The ponds observed contained numbers of minnows and the marsh immediately surrounding the pond drains rapidly enough to prevent the development of conditions where mosquitoes might breed.

Experimentation is also being made on the development of small areas suitable for the wading birds. For this purpose, areas bare of vegetation have been chosen and a pool 1½ to 2 feet deep is made somewhere within the area. Ditches draining these areas are blocked at such a height that water covers most of the area but does not reach the surrounding marsh grass. The pools provide a place where minnows can survive when the water over most of the area disappears through evaporation. Such areas should not provide conditions suitable for mosquito breeding, if the water is not permitted to stand in the marsh grass surrounding the area. A careful adjustment of the height of the dam at the outlet is necessary to accomplish this.

These experiments are being carried out on marshes where the minimum tidal range between low and high is about 9 feet. It would be of value to make observations of the effects of the same methods on marshes where the tidal range is much smaller and drainage consequently slower.

It appears from the above report that a program of migratory wildlife restoration can be carried on without impairing mosquito control. Our observations combined with those of persons who have watched conditions here for years show a marked increase in the use of this marsh by birds in 1936 and 1937 over the period from 1931 to 1936. It is axiomatic that migratory waterfowl will not rest where proper environment does not exist, but we were interested in ascertaining whether they would return to use their former haunts when restored (Plate 5). This they have done

in a gratifying manner and there is reason to expect that their numbers will increase from year to year.

Our experiments have proved that by avoiding drastic drainage, mosquito control work on our tide marshes can be carried on successfully without causing injury to migratory bird habitat. This is the preventive which should be followed from the beginning in mosquito control operations, thereby eliminating the need and expense of marsh restoration.

Harold M. Bradbury
State Dept. of Conservation
Boston, Mass.

AMOUNT OF GRIT TAKEN BY PHEASANTS IN SOUTHERN MICHIGAN

Paul D. Dalke

Pheasants experience little difficulty in obtaining grit in southern Michigan, where the soils are of glacial origin. Even in winter, snow does not remain on the ground for a length of time sufficient to cause shortage of grit. During periods of deep snow there are usually exposed places along drainage ditches, embankments, or highways where grit may be obtained.

In the examination of the gizzards of 352 adult (Dalke '37) and 138 young pheasants, gizzard stones were found most commonly to consist of quartz, granite, and chert. Fragments of igneous extrusive, and fine grained basic igneous, rocks were occasionally observed. The latter were undoubtedly from basalt. White sandstone, gneiss, and flint, occurred in very small amounts. Limestone was seldom observed in the gizzards, due no doubt to the acid in the gizzards, and the soft character of this stone. It is known that pheasants pick up limestone because bits were found in three of the crops examined.

TABLE 1
AVERAGE AMOUNT OF GRIT PER BIRD FOR EACH MONTH OF THE YEAR

Month	*Average Amount of Grit in Grams*
January	3.11
February	3.40
March	2.89
April	5.50
May	4.97
June	5.15
July	4.23
August	3.76
September	2.50
October	2.40
November	2.58
December	2.20
Yearly Average	3.39 ± .16

The quantity of gravel found in gizzards during the various months of the year varied greatly. (See Table 1.)

It is seen from these data that during the breeding months there is an increase in grit content. The increase was greater in female than in male birds. In several instances as much as 10 grams of gravel was found in the gizzards of laying hens. Presumably the increased consumption of grit may be closely correlated with egg production.

TABLE 2
AVERAGE AMOUNT OF GRIT CONTAINED IN GIZZARDS OF YOUNG PHEASANTS

Age in weeks	Average weight in grams	Age in weeks	Average weight in grams
1	0.43	7	2.19
2	0.59	8	1.16
3	0.35	9	2.12
4	0.85	10	3.08
5	0.98	11	2.34
6	1.03	12	2.59

The size and shape of gravel eaten varied greatly. The average diameter of over six hundred stones selected at random was 6.0 mm., and the largest 18.3 mm.

Young pheasants take grit soon after they start to eat. Crop analysis (Dalke '35) indicates that grit is taken regularly by birds from one day to three weeks of age, after which the consump-

tion of grit becomes sporadic. The average amount of gravel found in the gizzards of young pheasants from 1 to 13 weeks is shown in Table 2.

Pheasants 2 weeks old took a few stones as large as those eaten by adult birds, and birds three weeks of age or older used the same sized grit as mature pheasants. Odd items are sometimes found in the gizzard. One six-weeks old pheasant had eaten an empty .22 cartridge, and the remains of a button were found in another bird. Small fragments of glass occurred in several gizzards.

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THE MARKING OF RUFFED GROUSE FOR FIELD IDENTIFICATION[1]

Frank C. Edminster

The possibility of identifying individuals of any species in field research work on wildlife simplifies innumerable problems, many of which may not otherwise be solved. With some problems and some species, the use of leg bands suffices, but when field identification of a species like the ruffed grouse is required, bands are not enough.

Leg bands do have a definite value in ruffed grouse research, however, and all grouse brought to hand in the New York work are banded on both legs before release. When these birds are caught again or their remains found, records may be obtained from the bands that are not yielded by other marking methods. The use of bands is restricted to adult birds. Expanding celluloid leg bands have been tried on the chicks but none have proved satisfactory.

Experiments with various kinds of markings that might be visible in the field were begun in 1930. The successful methods have now been in use for seven years. There is little need of reviewing the numerous types tried and found unsatisfactory. Suffice it to say that all manner of paints, lacquers, dyes, clips, bells—even Chinese pigeon whistles—have been tested. Only two things have given satisfactory results, namely, markers made with certain aniline dyes applied to white chicken feathers, and nickle-plated cat bells.

[1] This paper is based on work done by the author when employed by the New York State Conservation Department.

Preparation of Marking Feathers

Four colors of feathers have proved satisfactory: white, red, orange, and yellow. Other colors were not bright enough to be readily distinguished in the woods. In regions where the grouse are less wary, green and blue also might prove satisfactory. The following dyes were used (obtainable from National Aniline and Chemical Company, 351 Abbott Road, Buffalo, New York): Yellow—"Wool Yellow—Extra Concentrated"; Orange—"Wool Orange—2 G Crystals"; and Red—"Croceine Scarlet M O O."

Preparation. A solution of soap is made by dissolving 5 grams of Ivory Soap Flakes in 1,000 cc. of distilled water and heating until lukewarm. The solution of each dye is prepared by dissolving 8 grams of the dye in 400 cc. of a solution that is made up by adding 50 cc. of concentrated sulphuric acid to 950 cc. of distilled water. The dye solutions are all used at the boiling point.

The feathers, which should be only white leghorn tail feathers (rectrices, not coverts), are sorted into bundles of 50. Each bundle is then immersed in the soap solution and rinsed thoroughly for a short time. The feathers are then rinsed in cold water and dyed.

In dyeing, the cleansed feathers are dipped in the solution in groups of about five for from 1 to 2 seconds, until the color is of the desired depth, the group being held in the hand by the quill tips throughout. Care should be taken not

to immerse them in the dye too long, as the brightest colors require only a very brief dip. If the feathers are left in the dye very long the colors become too deep for best field recognition. After dyeing they are rinsed in cold running water until bleeding stops.

Feathers should be shaken as dry as possible and then laid out singly on newspapers until they are completely dry. Dyeing in too large a bundle or drying in absorbent material such as cornstarch is not recommended, as the vanes of the feathers are likely to be torn.

AFFIXING MARKING FEATHERS ON THE BIRD

Two men should work together in marking, one to hold the bird and the other to apply the markings. The bird should be held firmly, but with not too much pressure, in both hands, with the heel of each hand holding the shoulder of one wing against the bird's body and the fingers holding the upper part of each leg. The head of the bird should point toward the man holding it. A large handkerchief or other piece of cloth should be placed over the bird, between the hands and the bird, and should cover all of the bird but the tail and legs. Thus covered, the bird will struggle less, and loss of feathers will be less apt to occur.

The marking feathers are applied to the tail, either three in the center or two at each side. Combinations of colors, as well as position on the tail, may be used for identification. Twenty birds may be marked with these colors and positions without repetition. If the outside two feathers are to be marked, the third feather from each side is cut off at the base; if the three center feathers are to be marked, the next feather on each side should be cut off. This helps to prevent the marked feathers from being covered by the natural ones, and so improves visibility.

Marking feathers may be attached to the natural feather either by glueing to the top with Duco Household Cement or by wiring to the quill of the natural feather. The wiring is preferable since it permits visibility of the colored feathers from either dorsal or ventral aspects.

The first step is to cut off with scissors, one inch of the end of the feather being marked. Then cut both of the vanes from that feather except the basal inch. This leaves simply the stiff quill with enough of the vanes at the base to prevent the marking feather from twisting. Then cut off the base and tip of the colored feather to fit the length of the grouse tail. Using sharp-nosed cutting pliers, cut two pieces of 26-gauge copper wire, each about two inches long. Bend each wire into a V shape, hold the marking feather on top of the bare quill in proper position, slip one V-shaped wire around the quills of both feathers near the base, twist the two ends of the wire together around the quills as tightly as possible with the fingers and then very tightly with the pliers. Clip off the loose ends. Be careful not to twist the wire enough to break it off. Also be careful not to pull on the tail feathers as they come out rather easily. Repeat this process with the second piece of wire at a point about two-thirds of the length of the feather from the base.

After all desired marking is finished and data recorded, the bird is released, quickly but gently. In so doing, the observer should conceal himself behind

some vegetation, allowing the bird to flush as normally as possible.

USE OF CAT BELLS FOR MARKING

The use of small nickle-plated cat bells fastened to the bird's wing has also proved quite satisfactory. These should be used on birds liberated far apart, or on birds also feather-marked, else identifications may be confused. The cat bell is fastened to the wing with 20-gauge copper wire that has been silver plated by electrolysis to prevent reaction with the flesh. The sharpened wire is run through the forearm of the wing between the radius and ulna bones and tied into the loop of the bell with a square knot. The loop through the wing should be as small as possible but not tight enough to bind the flesh. The wire should be tied with sharp-nosed pliers and care taken not to weaken the wire by unnecessary twisting. Eventually the bell will be lost by the bird, but we have found the method useful for a period of several months. The sound of the shaken bell when the bird flushes can be heard distinctly up to 100 feet. This method of marking is not recommended when combinations of colored feathers suffice for all the birds being marked.

MARKING BY CUTTING TAIL FEATHERS

Another method of field identification that has proved of some use is the cutting of a large V from the center of the bird's tail. As in the case of the bell, this is restricted to a few well-separated birds or to birds also feather-marked on the outside feathers so that identities will not be confused.

Marking of grouse, apart from leg-banding and cat bells, will last only until the moult in late summer. Our marking has been done on both sexes of birds winter-trapped, on all liberated hand-reared and purchased birds, and on females nest-trapped in the spring. Brood records with females still marked have been obtained as late as August 21st.

ACKNOWLEDGMENT

Credit is given to the Department of Industrial Chemistry at Cornell University for assistance and facilities in developing the dyeing practice used in this work.

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SOME RELATIONSHIPS OF QUAIL AND GROUND SQUIRRELS IN CALIFORINA

E. E. Horn

Rodents of various genera have been known to destroy the eggs of ground-nesting birds. The valley quail (*Lophortyx californica vallicola*) in California is a victim, though the extent to which its eggs are preyed upon by various species of rodents has not been accurately determined. The California digger squirrel, or Beechey ground squirrel (*Citellus beecheyi beecheyi*) and its close relative, the Douglas ground squirrel (*Citellus beecheyi douglasii*), are suspected of eating enough eggs to actually hold down the population of quail on areas where these squirrels are numerous. The following observations over a period of years strongly indicate this possibility and show the need for careful, detailed field study of the question.

During July 1922 a valley quail nest near Amity, Yamhill County, Oregon was robbed when it contained six eggs. The shell fragments were found about a squirrel mound thirty yards away.

During the 1932 and 1933 quail nesting seasons, on the Fifield Ranch of the Quinto Land and Cattle Co., in southeastern Santa Clara County, California, seven quail nests from which all eggs had been taken were found, but it was not possible to determine what had robbed the nest. A few squirrels were living close by. During May 1935, on this same ranch, a quail nest, kept under observation, remained intact until nine eggs had been laid. On May 11 it was found to have been robbed. Shell fragments of quail eggs were found at a rock outcropping in a Beechey ground squirrel colony close by. One egg was found in a surface cache made by the squirrels. So far as could be determined from shell fragments, four eggs had been eaten.

Again, on this same ranch, on May 12, 1935, a Beechey ground squirrel was observed robbing a mourning dove nest in a blue oak tree on the same general area. The squirrel climbed the tree, and, in the course of its travels through the branches came across the nest, probably by accident, to judge from its actions, ate one of the eggs, and carried the other away in its mouth.

From 1928 to the spring of 1937, an area of 15,000 acres on the Quinto Land and Cattle Co. holdings, Santa Clara County, California, was used for studies of various subjects, among which was the relative abundance of quail and Beechey ground squirrels. Cattlemen who were using this range stated that quail had not been numerous during the period 1925 to 1927. In the summer and fall of 1928 quail were not plentiful, being confined to the most favorable canyons, and were almost lacking on some potentially excellent quail range. Beechey ground squirrels were exceedingly numerous over parts of this range, especially in the well-watered canyons and other areas suited to quail, but where few quail existed. The population of squirrels varied with specific areas on the range. On some hillsides from 5 to 10 per acre would be found. Along canyon sides, especially near water, it was not uncommon to

count from 20 to 25 per acre. We are most concerned with these heavily squirrel-populated canyons.

During the years 1927, 1928, and 1929, the squirrels were reduced in numbers through the use of strychnine and thallium coated barley and oat baits. In the spring and summer of 1929 there were less than 1% of the original population of ground squirrels left on much of this area, and there was a very noticeable increase in the number of young quail following that nesting season. Where one or two pairs had been seen previously, small coveys now appeared. This increase continued at an accelerated rate up to the end of the drouth period in 1934. During 1934–35, the birds made an astounding gain. By 1936 they had increased on many sections of this 15,000-acre range so as to remind people of olden times. Some hunting had been done on portions of this ranch even during the quail low of 1928–30 and hunting increased as the quail increased. One canyon, in which only three pairs of quail could be found in 1929, yielded a 1936 season bag of 120 birds that we know of (more were taken but the number is unknown), and still some 300 birds remained at the close of the season. Another area, which contained few more than 100 birds in 1928, has "overflowed" adjacent canyons. As in cases observed elsewhere the increase of quail in this canyon immediately followed decrease in the number of ground squirrels. One excellent quail habitat in Merced County on the San Joaquin Valley side of this same large ranch has not shown as rapid an increase in quail to date as other sections. The area is well watered, cover is adequate, and hunting has been about the same as on other areas, but ground squirrels are still present in greater numbers than on the areas where quail have made remarkable increases.

The marked reduction of ground squirrels on the Pacheco area brought about an increase in forage, so that the stockman using this range increased the number of livestock by 25%. Other studies on this ranch conducted by the Biological Survey from June 1930 to December 1937, show that six squirrels per acre take 48% of the forage annually. The increased vegetation no doubt afforded increased quail food and cover, especially for nesting. This, together with the reduction in nest destruction by the squirrels, contributed to the uptrend in quail population. This increase started *after* decrease of the squirrels and *before* the end of the drouth period. By the time increased rainfall became a factor, the breeding stock had been vastly increased, and under the favorable conditions of 1934, 1935 and 1936, the birds became very abundant.

T. D. Woodbury, of the U. S. Forest Service, who has hunted quail in California for a good many years, remarked that in 1936 this area approached the condition as to quail abundance that existed in California 25 years ago.

E. M. Becker, Deputy Agricultural Commissioner of Los Angeles County, who has had wide experience with ground squirrels in that county for more than ten years, and who is vitally interested in wildlife, has told me on various occasions during the past four years, that he has found the greatest increase of quail on the areas from which ground squirrels have been removed. His experience is similar to that

had on the Pacheco area: the first season following the reduction of the squirrels saw some increase in the quail, and the second season resulted in a marked increase.

Harry Hunt, of the California State Department of Agriculture, relates similar observations relative to quail and ground squirrels made while he was Agricultural Commissioner of Monterey County.

From these instances of destruction of quail eggs by ground squirrels and the marked increase in quail on large areas following the reduction of the animals, it is strongly indicated that they are a factor influencing the density of quail populations. Whether similar results would be obtained under different habitat conditions is at present unknown.

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NOTES

As a matter of historical interest, there should be a record of the persons who were present at the meeting for organization of The Society of Wildlife Specialists in Washington, D. C., February 3, 1936, and at that time sealed their affiliation by paying the stipulated fee. Sixty are herewith listed and it is hoped none belonging in this roll of "real charter members" have been omitted; the total attendance was possibly twice that number.

Allan, Philip F., Baumgartner, F. M., Bennett, Logan J., Bode, I. T., Borell, A. E., Borell, Mrs. Elizabeth M., Brown, Alice L., Bump, Gardiner, Converse, Charles D., Cottam, Clarence, Dalke, Paul D., Darrow, Robert, Davison, Verne E., Edminster, Frank C., Feeman, A. L., Frison, T. H., Grater, Russell K., Green, R. G., Hawkins, A. S., Henika, Franklin S., Hicks, Lawrence E., Hill, Edwin, Holt, Ernest G., Horn, E. E., Johnson, Maynard S., Kelley, W. C., Kelso, Leon H., King, Ralph T., Kriebel, Ralph M., Laidlaw, A. F., LeDune, E. K., Leopold, Aldo, Llano, George A., Lund, Peder N., McAtee, W. L., McMurtrey, M. S., MacNamara, L. G., Marsh, Albert J., Marshall, William H., Martin, E. D., May, Richard M., Miller, J. Paul, Obenauf, Walter H., Olson, Herman F., Nelson, A. L., Neilsen, Charles, Pancoast, John M., Peters, Harold S., Rasmussen, D. I., Shillinger, J. E., Stevens, Ross O., Stoddard, Herbert L., Terres, J. Kenneth, Trippensee, R. E., Van Dersal, William R., Walker, Charles F., Whitaker, H. L., Wickliff, Edward L., Williams, C. S., Yeatter, R. E.,

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S. B. Locke, Conservation Director of the Izaak Walton League, on behalf of the national officers, extends members of The Wildlife Society a cordial invitation to attend the annual convention of the League which will be held at the Hotel Sherman in Chicago, April 21, 22, and 23.

The Secretary, Victor H. Cahalane, National Park Service, Washington, D. C., will appreciate information as to the present address of John M. Anderson, sometime of Andover, Ohio.

CORRESPONDENCE

LETTER TO THE EDITOR: Wildlife Cropping or Wildlife Restoration?

A year has rolled around since the birth of the Wildlife Society. Those who sat up nights with the infant can now feel sure of the continued existence of their lusty charge. But relieved of doubt concerning its initial survival, the attendant parents and fond relatives may perhaps indulge in certain speculations regarding its future development and ultimate influence upon conservation thought.

One question in particular arises: How nearly exclusively shall the Society devote itself to wildlife *management*—that is the manipulation of Nature for utilitarian purposes—as distinguished from a tendency to pause occasionally in order to see how Nature carries on without benefit of man's meddling?

Game management has been defined as "the art of cropping land for game." Most "wildlife management" today is essentially game management and involves practices designed for the benefit of certain favored species, often at the expense of certain others. The introduced Pheasant and Hungarian Partridge, for example, may expect to reap these benefits, but the native Bobcat or Duck Hawk will usually be lucky to escape with the damnation of faint praise implied in the designation, "not an important enemy," of this or that game species.

These musings, of course, do not question the vital part which game management and wildlife management ideas have played in the present trend toward rehabilitating the land. Had it not been for the unflagging efforts of a few far-sighted individuals who have developed these ideas during the past fifteen years, the present nationwide conservation movement might never have been born. At least without a knowledge of game management principles it would have been much less effective. And probably there would have been no Wildlife Society either.

On the other hand, the idea of managing wildlife as a crop is not without certain dangers as it becomes increasingly popular, especially if it becomes "the thing to do" in the eyes of the general public. Wildlife, or game, management fits in almost too well with our past habit of "managing" the other factors of our environment, as live stock, food plants, and forests. Of course, many wildlife management programs will for a long time be concerned with *restoration* of lands which through improper utilization have been largely ruined for wildlife.

Restoration of damaged habitats is surely safe ground. It is the idea of "cropping the land for game" which seems to present a certain hazard, and here we shall probably find that a little humility of spirit will not be amiss. After restoration is complete, it may be well for us to keep in mind that far from being able to improve upon nature, about the best that we can hope to do is to maintain an approximation of the normal balance. The managed forest cannot compare with the primeval forest in scientific interest or esthetic appeal. Neither can the game

covert which is managed for cropping purposes compare with the original, naturally balanced biotic complex.

Too much management, indeed, is likely to dull our appetite for wildlife appreciation. One of the reasons that our American open spaces tend to be more exciting to live in, even when depleted, than those of Europe, is that ours have not been excessively managed for centuries. Nature, with us, still has much vigorous spontaneity. All the "vermin" have not yet been destroyed. In some places the outdoor lover and naturalist can still listen to the howl of the Coyote, and, praise God, he can watch a Duck Hawk skimming over a pond and scaring the daylights out of a flock of ducks, or feel a thrill when a Cooper's Hawk darts into a covey of quail and carries off its victim in a cloud of feathers.

E. LOWELL SUMNER, JR.
National Park Service
San Francisco, Calif
March 17, 1938.

Letters to the Editor perhaps do not in every case require a reply. The Editor's sentiments in the direction Mr. Sumner indicates are so pronounced, however, that he is entirely willing to record them. They are expressed in the Statement of Policy that formed the first paper in THE JOURNAL OF WILDLIFE MANAGEMENT, and also in an editorial in the first number, particularly in the sentence that wildlife management is part of the greater movement for conservation of our entire native fauna and flora. If the Editor did not believe that thoroughly and if he did not feel that a large majority of the members of The Wildlife Society share that view, he would not have worked so much as he did toward establishment of the Society, nor would he continue to give so much time and energy as he does in editing its Journal.
—W. L. M.

EMPLOYMENT SERVICE OF THE WILDLIFE SOCIETY

Purpose: This service will be operated as a department of the JOURNAL for the dual purpose of publishing information concerning (1), available positions and (2), qualifications of persons seeking such positions.

Limitations: To conserve the time of officers, the Employment Service will be confined to announcements of openings and statements of the qualifications of candidates. All correspondence will be between prospective employers and applicants, and not with officers of the Society. Appointments to nearly all federal and many state positions in wildlife management are based upon Civil Service ratings. Aspirants should therefore apply to the U. S. Civil Service Commission, Washington, D. C., or to corresponding state organizations for announcements of examinations. Appointing officers are invited to report vacancies and new positions to the Employment Service.

Procedure: Each member will be entitled to one five-line statement of his education, qualifications, and preferences as to type of position in each volume. Additional lines will be charged for at the rate of 5 cents per line, and additional insertions at the same rate for all lines required.

All communications for the Employment Service should be sent to the Editor, W. L. McAtee, Bureau of Biological Survey, U. S. Dept. of Agriculture, Washington, D. C.

DICKERSON, L. M., Box 356 M, R.F.D. #1, Menlo Park, Calif. M.S. and Ph.D., University of Virginia, 1930. Five years college teacher, biological subjects; 3 years Ass't. and Assoc. Wildlife Technician, National Park Service. Both positions terminated by lack of funds. Desire position in relatively permanent program of research and teaching or practical wildlife management. Especially interested in fish and aquatic environments.

FISHER, LEE W., 135 Linden, East Lansing, Mich. B.S. and M.S. Michigan State College, 1934. Major zoology, minor, botany. Ph.D. Michigan State College, 1937. Wildlife management. Two years part time and one year and four months full time of field research on ruffed grouse and prairie chicken studies for the Game Division of the Michigan Department of Conservation. Position desired: field work in wildlife management, research, or teaching.

KOELZ, STEPHEN E., 2027 Seventh Ave., Moline, Ill. B.S., M.S. University of Illinois, 1936, majoring in ecology. Experience as graduate research assistant '35–'36; Biological Aid White River Migratory Waterfowl Refuge, U. S. Biological Survey, '37. On leave due to shortage in funds. Position desired in practical work, research, or teaching in the wildlife field.

LINCOLN, ALEXANDER, JR., 59 Codman Rd., Brookline, Mass. A.B. Harvard, 1932. Rating 90 on U. S. Civ. Serv. exam. for Jr. Biologist (Wildlife Management) Aug. 1937. Studying plant ecology and wildlife management at Harvard for M.A. Position desired in field work, research, or wildlife management, starting after May.

RUGGLES, DYER N., 330½ Armstrong Ave., Auburn, Ala. B.S. University of Minnesota, 1936; major wildlife management. Expect to receive M.S. degree in wildlife management at Alabama Polytechnic Institute in June 1938. Employed 12 months by Minnesota Conservation Department and 1½ years by Alabama Cooperative Wildlife Research Unit. Position desired: Research, teaching or field work in wildlife management.

WILSON, KENNETH A., Park St., Salisbury, Md. B.S. Forestry, Conn. State College; M.S. wildlife and forestry, University of Michigan. Employed two years as Game Technician and Regional Wildlife Technician with the Farm Security Administration. Furloughed from last position due to lack of funds. Desire work in research teaching, or practical wildlife management.

THE WILDLIFE SOCIETY

Report of the Secretary for the Year Ending with the Close of the Second Annual Meeting, February 14, 1938

The office of the Secretary has just completed a year crowded with more business than may occur for several succeeding years. The campaign for members was an activity of primary importance. Letters of invitation, statements relative to the organization and purposes of the Society, and a form letter to new members were mimeographed. Over 2,000 letters of invitation were mailed from the Secretary's office, the bulk of this number in April and May. Regional Representatives were particularly helpful in the mimbership campaign. Each one was kept informed of prospects and of new members. Approximately 100 follow-up personal letters were sent from the Secretary's office but of much more importance in this work of reminding prospects of the membership opportunity were the Regional Representatives. Their work has been invaluable both in letter writing and in personal contacts.

Special letters were sent from the Secretary's office to some 160 Supervisors of National Forests and Directors of Forest Service Experiment Stations calling attention to the Society and requesting cooperation in placing this information before members of their staffs. Dr. Ira N. Gabrielson also authorized the sending of letters, over his signature, to more than 150 persons employed in the Bureau of Biological Survey, commending the Society. Approximately 1,500 letters were sent to librarians of leading colleges and universities of the United States and Canada, outlining the purpose and scope of The Journal of Wildlife Management, and soliciting subscriptions.

The volume of correspondence soon made it imperative that a filing system be adopted but in order to reduce office overhead this has been kept as simple as possible. It has been necessary to establish a comprehensive card system for handling the membership roster, subscription list, and prospective membership file. This system now contains over 3,000 cards.

The minimum of work necessary to maintain these records and to take care of correspondence is considerable. For about three months after the organization meeting at St. Louis, all clerical assistance was donated by Miss Margaret Muehlhaus and Mrs. Grace Lee Conner of the National Park Service's Wildlife Division. The membership campaign and acceptances of new members, with necessarily much correspondence and record-checking between Treasurer, Secretary, and Membership Committee, was plainly a peak load, but it was also evident that regular work would be too heavy for volunteers to carry without reimbursement. With the approval of the President and Treasurer, therefore, it was decided to pay 50 cents an hour, for not to exceed seven hours per week, for stenographic help for the Secretary. This maximum average allowance has never been

reached. The Secretary wishes to acknowledge with gratitude the large amount of clerical work donated by Miss Muehlhaus and Mrs. Conner of the National Park Service staff, as described above, and by others through the good offices of Ernest G. Holt, W. L. McAtee, and Gardiner Bump.

Routing of personal history statements has been given great care. The records of applicants for Active Membership were forwarded to the Chairman of the Membership Committee, usually at weekly intervals. When returned with the recommendations of the Committee, complete records of border-line cases, whether accorded or refused the Active classification, were sent from one Council member to the next, with the names of all others of whose membership classification there had been less doubt. Due to the number of persons that are required by the Constitution to review these cases, the time in transit is fully two months. It is not apparent that this can be materially reduced.

Meetings attended by the Secretary during the year were those of the Ecological Society of America, the American Planning and Civic Association's Conference on National Parks, meeting of wildlife personnel of Region I, National Association of Audubon Societies, Izaak Walton League of America, American Ornithologists' Union, American Society of Mammalogists, the International Association of Game, Fish and Conservation Commissioners and the American Fisheries Society.

SUMMARY OF THE REPORT OF THE SECOND ANNUAL MEETING BALTIMORE, MARYLAND. FEBRUARY 14, 1938

The meeting was opened at 7:50 P.M. by President Rudolf Bennitt, with about 160 persons present. Reports of the Secretary, the Auditing Committee, the Treasurer, and the Editor were read and accepted. Regional Representatives of Regions II, V, and VI gave brief reports and made suggestions for the future. Means of nominating candidates for regional representatives came in for considerable discussion but no action was taken. The report of the Program Committee was made by E. G. Holt and W. R. Van Dersal. Chairman Gardiner Bump presented the report of the Membership Committee, which was adopted. Discussions followed on the subject of membership qualifications and Bump answered a number of questions regarding the work of his committee. The meeting was reassured that the question of advancement from the Associate to the Active grade should never be permanently closed and that in any individual case the matter may be reopened at any time by the Associate member desiring reconsideration.

President Bennitt stressed the desirability of continually raising the standards of the organization. He reported on affiliation with the Union of American Biological Societies, and with the American Association for the Advancement of Science, and mentioned the inadequate number of articles of high quality offered to the JOURNAL during the past year. W. L. McAtee's reappointment as Editor was announced, as was the action of the

Council (in the absence of specific instruction at the previous annual meeting) in removing two members of the Membership Committee whose terms would constitutionally expire this year.* It was recommended that these two men be placed on the Committee on Professional Standards. Names of nominees for the two vacancies on the Membership Committee were presented and James Moffitt of California and E. V. Komarek of Georgia were elected. The President also reported action of the Council authorizing establishment in Region 1 of the Northeast Section of the Society.

Upon request T. H. Langlois then discussed the matter of awakening the interest of ichthyologists in The Wildlife Society.

A proposed change in Article I of the By-laws (to make possible the submission of a single nominee for any office) was defeated. A proposed change in Article II of the By-laws for the addition of Canada and Mexico to the adjoining regions in the United States, as well as the inclusion of Alaska and Hawaii in Region VI, was adopted. Also adopted was the Council recommendation that the next annual meeting of the Society be held at the same time and place as the next North American Wildlife Conference. Referred to the Council was the matter of taking action, if necessary, on protection of wildlife interests in anticipated reduction of funds by Federal and other agencies. The meeting adopted a motion instructing the President to appoint a committee on Professional Standards which should make a report at the next annual meeting.

Under new business it was voted that the President of the Society should appoint a committee to cooperate with the Ecological Society of America and with other organizations on matters of common interest. Also adopted was a resolution that "steps be taken by Federal, State, and private agencies to do everything in their power to control the spread and prevent further ravages of" the rapid-killing wilt (*Cephalosporium* sp.), threatening the extermination of the persimmon, an important food for wildlife in the southeastern United States.

On the nomination of the Membership Committee and approval by the Council, J. N. Darling was unanimously elected an Honorary Member.

Chairman Yeatter than presented the Nominating Committee's report consisting of the slate of nominees for the various offices becoming vacant. The results of elections were as follows: A. A. Allen, President; T. H. Langlois, Vice-President; V. H. Cahalane, Secretary; and W. W. Chase, Treasurer. W. L. Finley was elected Trustee for the term expiring with the 1941 meeting. By a rising vote the thanks of the Society were tendered to the retiring President. The meeting adjourned at 12 midnight.

As no report has been made to the membership on the meeting at which

* Due to the election of T. H. Langlois as Vice-President, it was subsequently decided by the Council that he would be ineligible to continue to serve on the Membership Committee. The second name, that of W. R. Van Dersal, withdrawn from the roster of the Committee in the Council meeting on February 13, was therefore replaced. The Membership committee will continue to utilize the advice of Dr. Langlois as a "Special Consultant" on all applications of ichthyologists for membership.

The Wildlife Society was organized at St. Louis, Missouri, February 27–28, 1937, a brief summary is given herewith.

The meeting of the Society of Wildlife Specialists (the parent and temporary organization) was opened February 27 at 9:40 A.M. by President Ralph T. King. In the absence of Secretary-Treasurer, W. L. McAtee, he requested V. H. Cahalane to act as Secretary pro tem. Seventy-seven persons signed the register although an unknown number of additional affiliates who attended meetings on February 28 did not have an opportunity to add their names. The Secretary's report was read and adopted and committee reports were taken up. The President reported for the Chairman of the Organization Committee, advising the continuance of the organization in some form, as well as affiliation with the Ecological Society of America. After considerable discussion, it was voted 71–2 to maintain an independent status unaffiliated with any existing group. The President, however, was instructed to appoint a committee to arrange friendly cooperation with the Ecological Society on matters of common interest. The meeting adopted the name "The Wildlife Society" and business passed to the consideration of the report of the Committee on Constitution and By-laws. Adjournment at 5 P.M. found the work on the Constitution had proceeded through acceptance of Article II (relating to the Editor).

The meeting was reopened at 9:50 A.M. February 28 and the work of drafting and adopting the Constitution and By-laws was completed. Other business transacted was the adoption of the title of "THE JOURNAL OF WILDLIFE MANAGEMENT" for the publication, and extending an invitation to citizens of Canada and Mexico to affiliate with the Society. The ballot for officers resulted in the following elections: Rudolf Bennitt, President; Joseph S. Dixon, Vice-President; V. H. Cahalane, Secretary; Warren W. Chase, Treasurer. W. L. McAtee was elected a Trustee and the Membership Committee was designated as consisting of Gardiner Bump, L. E. Hicks, P. L. Errington, W. R. Van Dersal, and T. H. Langlois. The elected officers were empowered to appoint the six regional representatives for the year 1937, and the meeting adjourned at 11:45 A.M.

A brief special meeting was called by President Bennitt on the afternoon of March 2 for a resumé of the principal accomplishments of the organization meeting, announcement of members of the Council, the appointment of the Advisory Committee, and acceptance of the Editorship of the new JOURNAL by W. L. McAtee.

VICTOR H. CAHALANE,
Secretary

REPORT OF THE TREASURER FOR THE CALENDAR YEAR 1937

RECEIPTS:		
Balance from operations of The Society of Wildlife Specialists (from W. L. McAtee, Sec'y-Treas.)	$ 459.81	
Associate Dues (604 members)	1,812.05	
Journal Subscriptions (32½)	97.50	
TOTAL RECEIPTS		$2,369.36
DISBURSEMENTS:		
General Administration:		
Stationery and Printing	$ 313.17	
Postage, Registered Mail, Telegrams, etc.	296.75	
Secretarial Assistance	60.00	
Treasurer's Bond	5.00	
Books (2 copies Forest School Reports)	1.00	
Refund	2.00	
Publications:		
JOURNAL OF WILDLIFE MANAGEMENT (2 issues)	818.15	
TOTAL DISBURSEMENTS		$1,496.07
BALANCE (December 31, 1937)		$ 873.29

WARREN W. CHASE,
Treasurer

ABSTRACT OF THE REPORT OF THE MEMBERSHIP COMMITTEE

In a field as devoid of directional tradition, as heterogeneous in make-up and as inadequately charted as is Wildlife Management, any professional organizational attempt assumes certain definite responsibilities. Included are the definition of the field, the setting up of objectives, and the intelligent direction of activities towards their attainment.

To these ends, no single activity of a new organization exercises so directive an influence on its future course and characteristics as does the selection of its membership.

Collective thinking as regards membership qualifications at the formative meeting of the Society at St. Louis was largely limited to expressions of individual opinion, supplemented by four indicative decisions as follows:

1. Selection of the "semi-closed" professional type of society organization.
2. Statement of major objectives in the Constitution.
3. Restriction of membership to two classes, Active and Associate.
4. Adoption in the Constitution of articles dealing with membership requirements, which imply the necessity for "substantial" training and/or experience requirements as a basis for Active membership in the Society.

The Committee has attempted to interpret these indications of Society intent conservatively, pending the establishment of more definite standards and of closer delimitation of the "wildlife" field.

In considering applications, the responsibility of the Committee is strictly limited to appraising the qualifications presented as a basis for recommendations to the Council, in whose hands the final decision for classification lies.

To establish an equitable basis for class recommendations, the academic training and experience qualifications indicated on each each application for Society membership, as filed with the Secretary, were thoughtfully evaluated by each Committee member. More than 100 incomplete applications were referred to sponsors, either prior to or following Committee consideration; 51 being subsequently reconsidered. Puzzling applications, 97 in number, were retained for more detailed consideration of the full Committee prior to the Baltimore meeting of the Society, and all doubtful cases were referred to the Council for final action.

To safeguard against occasional error in Committee judgment, however, additional qualifications of any applicant recommended by the Committee for Associate ranking have in every case been reconsidered by the Committee upon written request of the applicant to the Secretary. It may be well to explain here that for personal reasons, a number of affiliates, unquestionably eligible for Active membership, have requested Associate status.

The failure of the Society to limit more definitely the field from which Active members might be drawn, the existence of opposed ideas as to the relative value of fundamental vs. applied training, and of the need for any substantial training in the face of proved ability to produce outstanding

practical results, presented a perplexing field for Committee interpretation.

The Committee having been chosen to plow its way through this uncharted assignment, has naturally given some thought to revising membership selection procedure which would:

1. Establish more definite professional standards as a basis for Active membership in the Society.
2. Provide a more accurate rating system, based on fairly definite units of academic and of experience training. This would make the rating of applicants more automatic and less dependent upon the judgment of sponsors and members of the Committee and Council.

As a basis for discussion, the following are suggested as definitions of professional standards for admission to the Active grade. To facilitate consideration, these have been arranged in four groups.

ACADEMIC STANDARDS

Group 4 rating. (Qualifications certainly adequate for Active membership)

A degree (B.S. or equal) with major emphasis directly on basic and applied biology and supplemented by a minimum of five comprehensive courses in the field of Wildlife Management.

Group 3 rating. (Qualifications probably adequate for Active membership, providing applicant has also also had substantial experience)

A degree (B.S. or equal) with major emphasis directly on basic biology supplemented by a minimum of five comprehensive courses definitely related to the field of Wildlife Management.

Group 2 rating. (Qualifications probably not adequate in themselves for Active membership, though substantial in character)

Completion of a minimum of 2 years of studies of college grade with major emphasis on biology.

Group 1 rating.

Less than the minimum required for Group 2 rating.

EXPERIENCE STANDARDS

Group 4 rating. (Qualifications certainly adequate for Active membership)

A minimum of 8 years of substantial and broad experience in the specific field of Wildlife Management, of such a nature as to offer an opportunity to secure an understanding of Wildlife Management principles, comparable with that gained from the academic training required for the corresponding group under Academic Standards.

Group 3 rating. (Qualifications probably adequate for Active membership, providing applicant has also had substantial academic training)

A minimum of 4 years of substantial and broad experience in the specific field of Wildlife Management of such a nature as to offer an opportunity to secure an understanding of Wildlife Management principles comparable with that gained from the academic training required for the corresponding group under Academic Standards.

Group 2 rating. (Qualifications probably not adequate in themselves for Active membership, though substantial in character)

A minimum of 2 years of substantial

and broad experience in the specific field of Wildlife Management of such a nature as to offer an opportunity to secure an understanding of Wildlife Management principles comparable with that gained from the academic training required for the corresponding group under Academic Standards.

Group 1 rating.

Less than the minimum required for Group 2 rating.

The above defined academic and experience standards are suggested as minimum but not exact requirements. Others, equivalent for the purpose of maintaining professional standards might be substituted. In all cases other than those in which an applicant has received a Group 4 rating, both academic and experience qualifications would be taken into consideration.

Since the above suggestions are the outgrowth of Committee experience over the past year, it may be taken for granted they are not too great a departure from those informal standards which have to date been utilized as a basis for classification. If anything, they are slightly more severe.

GARDINER BUMP, *Chairman*
WILLIAM R. VAN DERSAL
PAUL L. ERRINGTON
T. H. LANGLOIS
LAWRENCE E. HICKS

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